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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/848,815

05/18/2004

Giuseppe Messina

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08/03/2007

SEED INTELLECTUAL PROPERTY LAW GROUP PLLC

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EXAMINER

PERUNGAVOOR, SATHYANARAYA V

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

08/03/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/848,815	Applicant(s) MESSINA ET AL.	
	Examiner Sath V. Perungavoor	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
 4a) Of the above claim(s) 8-10,13,19,20 and 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7,11,12,14-18,21 and 23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>10/03/06</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

[1] This application contains claims directed to the following patentably distinct species:

1. Species I: Image exposure correction corresponding to claims 1-7, 11, 12, 14-18, 21 and 23.
2. Species II: Image exposure correction in a Bayer array corresponding to claims 8-10, 13, 19, 20 and 22.

[2] The species are independent or distinct because each species receives a separate classification species I is classified in 382/274 and species II is classified in 348/222.1.

[3] Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, 1, 4, 5, 11, 14 and 16 are generic.

[4] Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

[5] Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable

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generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

[6] During a telephone conversation with Mr. Robert Iannucci (Reg. No. 33,514) on July 16, 2007 a provisional election was made without traverse to prosecute the invention of species I, claims 1-7, 11, 12, 14-18, 21 and 23. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-10, 13, 19, 20 and 22 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

[7] Claims 1, 11, 14 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Takeshima.

Regarding claim 1, Takeshima meets the claim limitations, as follows:

A digital image processing method [*fig. 1*], comprising the steps of: extracting chromatic information (*i.e. R-Y and B-Y*) of an image taken by an image taking device and related to a human subject [*col. 3, ll. 29-32*]; detecting (*i.e. 1*) visually interesting regions (*i.e. skin area*) in the taken image by recognizing areas corresponding to skin

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of the subject, wherein the recognized areas are the visually interesting regions [col. 3, ll. 32-42]; and correcting an exposure (*i.e.* 6) of said taken image by normalizing a grey scale (*i.e.* Y) of said taken image based on said visually interesting regions (*i.e.* skin) [col. 4, ll. 1-5].

Regarding claims 14 and 23, all claimed limitations are set forth and rejected as per discussion for claim 1.

Regarding claim 11, Takeshima meets the claim limitations, as follows:

A digital image processing method according to claim 1, further comprising a final color reconstruction step [fig. 1; output of 5 and 6].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

[8] Claims 2, 3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshimaⁱ in view of Terrillon et al. ("Terrillon")ⁱⁱ further in view of Hsu et al. ("Hsu")ⁱⁱⁱ.

Regarding claim 2, Takeshima meets the claim limitations as set forth in claim 1.

Takeshima does not explicitly disclose the following claim limitations:

A digital image processing method according to claim 1, wherein said recognizing step comprises constructing a probabilistic slicing of said image taken in a YcrCb format to evaluate if pixels of said image must be classified as belonging to said areas corresponding to the skin of said subject.

However, in the same field of endeavor Terrillon discloses the deficient claim limitations, as follows:

A method for recognizing skin *[abstract]* comprising: constructing a probabilistic slicing (*i.e. single Gaussian model*) of said image taken in a TSL format to evaluate if pixels of said image must be classified as belonging to said areas corresponding to the skin of said subject *[page 2, col. 2, para. 1-3]*.

Takeshima and Terrillon do not explicitly disclose the following claim limitation:

The image being in the YCrCb format.

However, in the same field of endeavor Hsu discloses the deficient claim limitations, as follows:

The image being in the YCrCb format *[page 697, col. 2, para. 1]*.

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Takeshima and incorporate the skin detection method of Terrillon, the motivation being robustness to illumination changes *[Terrillon: page 1, col. 2, para. 1]*. It would have been further obvious to one with ordinary skill in the art at the time of invention to have an image in the YCrCb format, the motivation being compressed images use this color space and it is also similar to TSL *[Hsu: page 697, col. 2, para. 1]*.

Regarding claim 3, Terrillon meets the claim limitations (in view of claim 2), as follows:

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A digital image processing method according to claim 2, wherein pixels with higher grey values (*i.e.* 1) are classified as belonging to said areas corresponding to the skin of said photographed subject [page 3, col. 1, para. 1].

Regarding claim 15, all claimed limitations are set forth and rejected as per discussion for claim 3.

[9] Claims 4-7 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshimaⁱ in view of Soriano et al. ("Soriano")^{iv}.

Regarding claim 4, Takeshima meets the claim limitations as set forth in claim 1.

Takeshima does not explicitly disclose the following claim limitations:

A digital image processing method according to claim 1, wherein said recognizing step comprises applying a threshold area of said image taken in an RGB format to evaluate if pixels of said image must be classified as belonging to said areas corresponding to the skin of said subject.

However, in the same field of endeavor Soriano discloses the deficient claim limitations, as follows:

A digital image processing method according to claim 1, wherein said recognizing step comprises applying a threshold area (*i.e.* eq. 1) of said image taken in an RGB format to evaluate if pixels of said image must be classified as belonging to said areas corresponding to the skin (*i.e.* $Skin(r,g)=1$) of said subject [page 840, col. 2, para. 5].

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Takeshima and incorporate the skin detection method of Soriano, the motivation being robustness to illumination changes [*Soriano: abstract*].

Regarding claim 5 Soriano meets the claim limitations (in view of claim 4), as follows:

A digital image processing method according to claim 4, wherein applying said threshold area comprises constructing a chrominance slicing histogram (*i.e.* $S(r,g)$) of said taken image [*page 840, col. 1, para. 3*].

Regarding claim 6 Soriano meets the claim limitations (in view of claim 5), as follows:

A digital image processing method according to claim 5, wherein constructing said chrominance slicing histogram uses normalized channels r and g of the type:

$r=R/(R+G+B)$ $g=G/(R+G+B)$ R , G and B being red, green and blue values of each pixel of said taken RGB image [*page 840, col. 1, para. 2*].

Regarding claim 7 Soriano meets the claim limitations (in view of claim 5), as follows:

A digital image processing method according to claim 5, wherein said recognizing step uses said chrominance slicing histogram (*i.e.* $S(r,g)$) to detect said areas corresponding to the skin of said subject formed by the pixels of said taken image belonging in said chrominance slicing histogram to said threshold area [*page 840, col. 1, para. 3*].

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Regarding claims 16-18, all claimed limitations are set forth and rejected as per discussion for claims 4-7.

[10] Claims 12 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshimaⁱ in view of Sakaue et al. ("Sakaue")^v.

Regarding claim 12, Takeshima meets the claim limitations as set forth in claim 11.

Takeshima does not explicitly disclose the following claim limitations:

A digital image processing method according to claim 11, said image being taken in an RGB format, wherein said final color reconstruction step comprises the relations:

$$R' = 0.5 (Y' / Y (R + Y) + R - Y) \quad G' = 0.5 (Y' / Y (G + Y) + G - Y)$$

$$B' = 0.5 (Y' / Y (B + Y) + B - Y)$$

R, G, B, and Y being respective red, green, blue, and luminance values of said taken image, Y' being a desired luminance value, and R', G', and B' being respective red, green, and blue values of the image after said final color reconstruction step.

However, in the same field of endeavor Sakaue discloses the deficient claim limitations, as follows:

A digital image processing method according to claim 11, said image being taken in an RGB format, wherein said final color reconstruction step comprises the relations:

$$R' = 0.5 (Y' / Y (R + Y) + R - Y) \quad G' = 0.5 (Y' / Y (G + Y) + G - Y)$$

$$B' = 0.5 (Y' / Y (B + Y) + B - Y)$$

R, G, B, and Y being respective red, green, blue, and luminance values of said taken image, Y' being a desired luminance value, and R', G', and B' being respective red, green, and blue values of the image after said final color reconstruction step [*page 558, col. 1, para. 1*].

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Takeshima and incorporate the correction method of Sakaue, the motivation being to minimize change in color saturation [*Sakaue: page 557, col. 2, para. 2*].

Regarding claim 21, all claimed limitations are set forth and rejected as per discussion for claims 12.

Contact Information

[11] Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Sath V. Perungavoor whose telephone number is (571) 272-7455. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Matthew C. Bella whose telephone number is (571) 272-7778, can be reached on Monday to Friday from 9:00am to 5:00pm. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system,

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see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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i US 5,585,860

ii NPL document titled, "Comparative Performance of Different Skin Chrominance Models and Chrominance Spaces for the Automatic Detection of Human Faces in Color Images".

iii NPL document titled, "Face Detection in Color Images".

iv NPL document titled, "Skin detection in video under changing illumination conditions".

v NPL document titled, "Adaptive Gamma Processing of the Video Cameras for the Expansion of the Dynamic Range"



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